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Planning for Future Vehicle Emissions Testing Programs

The Wisconsin Department of Transportation operates one of the nation's most effective vehicle emissions inspection/maintenance (I/M) programs. Most vehicles registered in the Milwaukee metropolitan area are tested for emissions that contribute to ground-level ozone formation. WisDOT contracts with Envirotest Wisconsin, Inc. to conduct the tests using the IM240 dynamometer test cycle or an on-board diagnostics (OBDII) computer system check if the vehicle is a 1996 or newer model. Corrective repairs to vehicles failing the test reduce emissions and help the state meet US Environmental Protection Agency ozone standards.

What's the Problem?

Despite consistently and efficiently achieving targeted emission reductions, WisDOT's I/M program may have to change to meet future conditions and demands. Future improvements in motor vehicles and cleaner burning fuels will reduce the air quality benefits associated with traditional I/M programs such as Wisconsin's. New and better emission test methods are likely to become available. Therefore, WisDOT must remain cognizant of emerging technologies, program methodologies, and results of ongoing research and monitoring efforts by other states' I/M programs, as well as federal and private sector efforts.

Research Objectives

WisDOT's Bureau of Environment (responsible for the department's air quality efforts) and the Bureau of Motor Vehicle Services (responsible for overseeing the I/M program) jointly contracted with the consultant for a literature and best practices scan. Results of the study are to be used in planning for the future of I/M in Wisconsin. The goals of the study were:

- Identify and discuss the key issues related to Wisconsin's I/M program;
- Assess the validity of existing information to address these issues;
- Assess the need and scope for expanded studies.

Research Results

The study reports findings in the following areas:

- Currently 31 states employ I/M programs. Of the original 98 ozone non-attainment areas in 24 states, 39 areas continue to exceed the 1-hour ozone standard. If the proposed 8-hour ozone standard takes effect, 332 counties in 33 states are projected to exceed it.
- Fourteen states are studying some aspect of I/M programs with five states engaged in major research projects.

The report reviews the status of current I/M technology in 7 key areas.

Key Findings

- Inspection/maintenance programs will continue to be an important part of current and future ozone control strategies. Wisconsin, along with several other states, continues to violate the 1-hour ozone standard, and areas of the state will likely be designated non-attainment for the proposed 8-hour standard.
- Wisconsin benefits from being able to exchange information with a number of other states successfully using similar inspection methods.
- Wisconsin can benefit by keeping close communication with states with major I/M research plans. The states of California, Arizona, Virginia and Oregon are planning or performing research in: new types of I/M networks (particularly OBD inspection); low income repair assistance programs (LIRAP); finding "liquid leakers" and other vehicles with evaporative emission problems; OBDII effectiveness; remote sensing effectiveness on current model vehicles; and reducing diesel emissions.

from research to reality

BRIEF

RESEARCH DEVELOPMENT & TECHNOLOGY TRANSFER

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The Wisconsin Department of Transportation

Wisconsin's vehicle inspection/ maintenance program for the Milwaukee metropolitan area utilizes the IM240 dynamometer test cycle along with on-board diagnostic (OBD) checks.

- Wisconsin's OBDII program appears to be successful with the expected percentage of vehicles failing the test and no reported difficulty in getting vehicles to comply with OBDII requirements.
- Wisconsin can develop incentives to encourage motorists to respond to illuminated malfunction indicator lamps (MIL), even in non-I/M program areas. Educating motorists about their OBDII systems is a critical step in getting motorists to respond to illuminated MILs. Also, Wisconsin could use alternative inspection networks to perform convenient and inexpensive OBDII tests.
- Identifying and repairing vehicles with liquid leaks or gross evaporative leaks can yield substantial emission reductions.
- Inspecting diesels in an I/M program is expensive and has minimal benefits. Wisconsin should revisit this issue when remote sensing and other less obtrusive diesel test methods are developed and proven.
- Remote sensing does not appear to be a promising option for improving Wisconsin's I/M program efficiency, due to concerns over errors of omission (false passes) and errors of commission (false failures).
- I/M programs, reformulated fuels, Low-Emission Vehicle (LEV) standards and other controls implemented for motor vehicles have significantly reduced toxic emissions, an important benefit, even though I/M programs were enacted primarily to reduce ozone levels.

"This scoping study will be a great help in designing our future I/M programs. We also now have a handle on I/M related research under way in other states."

- Stephen Hirshfeld, WisDOT Division of Motor Vehicles, Bureau of Driver Services

Further Research

The report recommends further research in Wisconsin to better define future state I/M program requirements, particularly related to motorist response to illuminated malfunction indicator lamps (MILs) and decentralized inspections using inexpensive OBDII equipment. Three additional research areas were identified as potential candidates for pooled studies with other states: how to find and repair vehicles with liquid leaks; assessing the need for back-up tailpipe tests on high mileage OBDII vehicles; and ensuring OBDII inspections can't be defeated by cheater devices.

Implementation

The report will serve as both an evaluation and planning tool for WisDOT's Bureau of Vehicle Services and Bureau of Environment. I/M related research in other states will be monitored for possible application in Wisconsin, and WisDOT will contact other state I/M programs to explore possible pooled fund studies.

Benefits of This Research

Results of this study indicate that Wisconsin's I/M program is an effective part of Wisconsin's overall ozone control strategy. The report provides a solid basis for research and planning activities in WisDOT and may be helpful as well to other states, agencies and organizations involved in I/M.

For more information

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